Esprit Working Group: Types for proofs and programs

Types Summer School: Theory and Practice of Formal Proofs

French Riviera, France
30 August - 10 September 1999

Objective and background.

During the last few years major achievements have been made in using computers for *interactive proof developments* to produce *secure software.*

This two weeks' course is for postgraduate students, researchers and industrials who want to learn about interactive proof development. There will be introductory and advanced lectures on lambda calculus, type theory, logical frameworks, program extraction, and other topics which give relevant theoretical background. Several talks will be devoted to the presentation of applications.

The proof assistants presented in the school represent the current state-of-the-art in interactive theorem proving. Participants will get extensive opportunities to use the systems in a workstation environment for developing their own proofs.

Location and Accommodation.

The summer school will take place in a pleasant conference center near the sea. More information will be available soon.

Application.

The deadline for application is **Monday May 17, 1999**. All applicants will receive notice by Monday June 21, 1999.

Send your application form to both Joëlle Despeyroux and Monique Simonetti. Note that a letter of recommendation should be sent in addition to the application form.

A registration form will be available soon, to be sent upon reception of the notification of acceptance of attending the school.

Feel free to contact Joelle.Despeyroux.

Grant.

Limited funds will be available to offer a few grants. In particular, participants from lower-income countries might get a grant covering a substantial part of the costs for travel and subsistence.

The dead-line for application for a grant is **Friday April 2**. You will receive notification of acceptance/rejection by Monday April 19.

To apply for a grant, fill the required parts of the application form.

Program Committee:

Joelle.Despeyroux, INRIA (Chair)	Martin Hofmann, University of Edinburgh
Gilles Dowek, INRIA	Bengt Nordstrom, Chalmers University

Contact:

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Sponsor: France-télécom.

Program

The program will consist of four parts:

1. Introduction and background
   - Henk Barendregt: Typed λ-calculus: Simple, dependent and higher-order types
   - Bengt Nordström: The Curry-Howard isormorphism and Heyting's explanations
   - Thierry Coquand: Gödel's T; inductive definitions
   - Henk Barendregt: Representation and verification of proofs in type systems
2. An overview of each of the four proof assistants to be used in the course, including some short developments of actual proofs
   - Catarina Coquand and Thomas Hallgren: Agda (the current version of the Alf family)
   - Benjamin Werner : The Coq system
   - Tobias Nipkow: The Isabelle system
   - Zhaohui Luo: The Lego system
3. General talks
   - Per Martin-Löf: The semantic significance of computation
   - Jean-Louis Krivine: Lambda-calculus and ZF
   - Yves Lafont: Linear logic and computer science
   - Tobias Nipkow: Higher-order rewrite systems
   - Michel Parigot: Program extraction in 2nd order classical logic
   - Stefano Berardi: Types and program optimization
   - Laurent Théry: A quick overview of PVS and HOL
4. Applications
   - John Harrison: Verification of systems; an industrial point of view
   - Jaco van de Pol: Proofs of correctness of protocols
   - Thierry Coquand: Certified computer algebra
   - Aarne Ranta: Linguistic applications of type theory

In addition to this, there will be several hours reserved for lab work on the computers each day.